



(i) GENERAL INFORMATION:

(i) APPLICANT: TSYRLOVA, IRINA
WOLPE, STEPHEN D.

(ii) TITLE OF INVENTION: INHIBITOR OF STEM CELL PROLIFERATION AND
USES THEREOF

(iii) NUMBER OF SEQUENCES: 37

(iv) CORRESPONDENCE ADDRESS:

(A) ADDRESSEE: NIXON & VANDERHYE P.C.
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(E) COUNTRY: U.S.A.
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(v) COMPUTER READABLE FORM:

(A) MEDIUM TYPE: Floppy disk
(B) COMPUTER: IBM PC compatible
(C) OPERATING SYSTEM: PC-DOS/MS-DOS
(D) SOFTWARE: PatentIn Release #1.0, Version #1.30

(vi) CURRENT APPLICATION DATA:

(A) APPLICATION NUMBER: US 08/832,443
(B) FILING DATE: 04-APR-1997
(C) CLASSIFICATION:

(vii) ATTORNEY/AGENT INFORMATION:

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(B) REGISTRATION NUMBER: 32,205
(C) REFERENCE/DOCKET NUMBER: 1331-222

(ix) TELECOMMUNICATION INFORMATION:

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INFORMATION FOR SEQ ID NO:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 13 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS:
(D) TOPOLOGY: linear

(ii) FEATURE TYPE: CDS (1)

1. The amino acid sequence of the protein is as follows:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 15 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS:
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:2:

Cys	Phe	Pro	His	Phe	Asp	Leu	Ser	His	Gly	Ser	Ala	Gln	Val	Cys
1				5					10				15	

(2) INFORMATION FOR SEQ ID NO:3:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 19 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS:
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:3:

Asp	Ala	Leu	Thr	Asn	Ala	Val	Ala	His	Val	Asp	Asp	Met	Pro	Asn	Ala
1				5					10					15	

Leu Ser Ala

(2) INFORMATION FOR SEQ ID NO:4:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 15 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS:
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

- (C) STRANDEDNESS:
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:5:

Leu Val Val Tyr Pro Trp Thr Gln Arg
1 5

(2) INFORMATION FOR SEQ ID NO:6:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 8 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS:
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:6:

Leu Val Val Tyr Pro Trp Thr Gln
1 5

(2) INFORMATION FOR SEQ ID NO:7:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 7 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS:
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:7:

Leu Val Val Tyr Pro Trp Thr
1 5

(2) INFORMATION FOR SEQ ID NO:8:

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:8:

Leu Val Val Tyr Pro Trp
1 5

(2) INFORMATION FOR SEQ ID NO:9:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 5 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS:
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:9:

Leu Val Val Tyr Pro
1 5

(2) INFORMATION FOR SEQ ID NO:10:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 5 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS:
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:10:

Val Val Tyr Pro Trp Gln
1 5

(2) INFORMATION FOR SEQ ID NO:11:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 7 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS:
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

Tyr Val Tyr Gln Ala Gln
1 5

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 6 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS:
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:12:

Tyr Pro Trp Thr Gln Arg
1 5

(2) INFORMATION FOR SEQ ID NO:13:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 5 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS:
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:13:

Tyr Pro Trp Thr Gln
1 5

(2) INFORMATION FOR SEQ ID NO:14:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 6 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS:
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:14:

Asp Met Trp Met Phe Arg

1 6
A. LENGTH: 6 amino acids
B. TYPE: amino acid
C. STRANDEDNESS: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:15:

```
GTGCTGCTC CTGCCGACAA GACCAACGTC AAGGCGGCTT GGGGTAAGGT CCGCGCGGCAC      50
GCTGGCGAGT ATGGTTCGGA GGCCCTGGAG AGGATGTTCC TGTCCTTCCC CACCACCAAG     100
AGCTACTTCC CGCACTTCGA CCGAGCGCAC GGCTGTGCCC AGGTTAAGGG CCAAGGCAAG     150
AAGGTGGGCG ACCGCTGAC CAACGCGGTG GCGCAGTGGG ACGACATGCC CAACGCGGTG     200
TCCGCGCTGA GCGACCTGCA CCGGCACAAG CTTCGGGTGG ACCCGGTCAA CTCGAAGCTC     250
CTAAGCCACT GCGTGTGGT GACCTGGGCC GCGCAGTCC CCGCGGAGTT CACCGCTGCG     300
GTGCACGCGT CCTTGGACAA GTTCTGGCT TCTGTGAGCA CCGTGTGAC CTCCAAATAC     350
CGT                                                                    423
```

(2) INFORMATION FOR SEQ ID NO:16:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 141 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS:
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:16:

```
Val Leu Ser Pro Ala Asp Lys Thr Asn Val Lys Ala Ala Trp Gly Lys
1      5      10      15
Val Lys Ala His Ala Gly Gln Tyr Gly Ala His Ala Leu Glu Asn Met
20     25     30     35     40
Pro Leu Ser Pro Pro Thr Thr Lys Thr Tyr Pro Pro His Pro Asp Leu
45     50     55     60
Ser His Gly Ser Ala Gln Val Lys Gly His Gly Lys Lys Val Ala Asp
65     70     75     80
Ala Leu Thr Asn Ala Val Ala His Val Asp Asp Met Pro Asn Ala Leu
85     90     95    100    105    110    115    120    125    130    135    140    141
```

Leu Ala Ser Val Ser Thr Val Leu Thr Ser Lys Tyr Arg
 130 135 140

(2) INFORMATION FOR SEQ ID NO:17:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 438 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:17:

GTGCACCTGA CTCTGAGGA GAAGTCTGCC GTTACTGCCG TGTGGGGCAA GGTGAACGTG	60
GATGAAGTTG GTGCTGAGGC CCTGGGCAGG CTGCTGCTGG TCTACCTTTG GACCCAGAGG	120
TTCTTTGAGT CCTTTGGGGA TCTGTCCACT CCTGATGCTG TTATGGGCAA CCTAAGGTG	180
AAGGCTCATG GCAAGAAACT GCTCGGTGCC TTAGTGTATG GCGTGGGTCA CCTGGACAAC	240
CTCAAGGGCA CCTTTGCCAC ACTGAGTGAG CTGCACIGTG ACAAGGTGCA CGTGGATCCT	300
GAGAACTTCA GGCTGCTGGG CAAGGTGCTG GTCTGTGTGC TGGCCCATCA CTTTGGCAAA	360
GAATTCACCC CACCAAGTGA GGCTGCCTAT CAGAAAGTGG TGGCTGGTGT GGCTAATGCC	420
CTGGCCCAACA AGTATCAC	438

(3) INFORMATION FOR SEQ ID NO:18:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 146 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS:
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:18:

Val His Leu Thr Ser Gly His Lys Ser Ala Val His Ala Leu Thr Lys

Lys Lys Val Leu Gly Ala Phe Ser Asp Gly Leu Ala His Leu Asp Asn
 65 70 75 80
 Leu Lys Gly Thr Phe Ala Thr Leu Ser Glu Leu His Cys Asp Lys Leu
 85 90 95
 His Val Asp Pro Glu Asn Phe Arg Leu Leu Gly Asn Val Leu Val Cys
 100 105 110
 Val Leu Ala His His Phe Gly Lys Glu Phe Thr Pro Pro Val Gln Ala
 115 120 125
 Ala Tyr Gln Lys Val Val Ala Gly Val Ala Asn Ala Leu Ala His Lys
 130 135 140
 Tyr His
 145

(2) INFORMATION FOR SEQ ID NO:19:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 141 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS:
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:19:

Val Leu Ser Gly Glu Asp Lys Ser Asn Ile Lys Ala Ala Trp Gly Lys
 1 5 10 15
 Ile Gly Gly His Gly Ala Glu Tyr Gly Ala Glu Ala Leu Glu Arg Met
 20 25 30
 Phe Ala Ser Glu Pro Thr Lys Lys Lys Phe Pro His Phe Asp Val
 35 40 45
 Ser His Gly Ser Ala Glu Val Lys Gly His Gly Lys Lys Val Ala Asp
 50 55 60
 Ala Leu Ala Ser Ala Ala Gly His Leu Asp Asp Leu Pro Gly Ala Leu
 65 70 75 80
 Ser Ala Leu Ser Asp Leu His Ala His Lys Leu Arg Val Asp Pro Val
 85 90 95

(2) INFORMATION FOR SEQ ID NO:20:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 146 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS:
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:20:

Val His Leu Thr Asp Ala Glu Lys Ala Ala Val Ser Cys Leu Trp Gly
1 5 10 15
Lys Val Asn Ser Asp Glu Val Gly Gly Glu Ala Leu Gly Arg Leu Leu
 20 25 30
Val Val Tyr Pro Trp Thr Gln Arg Tyr Phe Asp Ser Phe Gly Asp Leu
 35 40 45
Ser Ser Ala Ser Ala Ile Met Gly Asn Ala Lys Val Lys Ala His Gly
50 55 60
Lys Lys Val Ile Thr Ala Phe Asn Asp Gly Leu Asn His Leu Asp Ser
65 70 75 80
Leu Lys Gly Thr Phe Ala Ser Leu Ser Glu Leu His Cys Asp Lys Leu
 85 90 95
His Val Asp Pro Glu Asn Phe Arg Leu Leu Gly Asn Met Ile Val Ile
100 105 110
Val Leu Gly His His Leu Gly Lys Asp Phe Thr Pro Ala Ala Gln Ala
115 120 125
Ala Phe Gln Lys Val Val Ala Gly Val Ala Thr Ala Leu Ala His Lys
130 135 140
Lys His
145

(2) INFORMATION FOR SEQ ID NO:21:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 141 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS:

1	5	10	15
Val Gly Gly Gln Ala Gly Ala His Gly Ala Glu Ala Leu Glu Arg Met			
20	25	30	
Phe Leu Gly Phe Pro Thr Thr Lys Thr Tyr Phe Pro His Phe Asn Leu			
35	40	45	
Ser His Gly Ser Asp Gln Val Lys Ala His Gly Gln Lys Val Ala Asp			
50	55	60	
Ala Leu Thr Lys Ala Val Gly His Leu Asp Asp Leu Pro Gly Ala Leu			
65	70	75	80
Ser Ala Leu Ser Asp Leu His Ala His Lys Leu Arg Val Asp Pro Val			
85	90	95	
Asn Phe Lys Leu Leu Ser His Cys Leu Leu Val Thr Leu Ala Ala His			
100	105	110	
His Pro Asp Asp Phe Asn Pro Ser Val His Ala Ser Leu Asp Lys Phe			
115	120	125	
Leu Ala Asn Val Ser Thr Val Leu Thr Ser Lys Tyr Arg			
130	135	140	

(2) INFORMATION FOR SEQ ID NO:22:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 146 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS:
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(iii) SEQUENCE DESCRIPTION: SEQ ID NO:22:

Val His Leu Ser Ala Val His Lys Val Ala Val Leu Gly Leu Thr Gly		
1	10	20
Lys Val Asn Val Asp Gln Val His Gly Val Ala Leu Gly Arg Leu Leu		
20	25	30
Val Val Tyr Pro Trp Thr Gln Arg Phe Phe Glu Ser Phe Gly Asp Leu		
35	40	45
Ser Asn Ala Asp Ala Val Met Gly Asn Pro Lys Val Lys Ala His Gly		

Val Leu Ala Arg Arg Leu Gly His Asp Phe Asn Pro Asp Val Gln Ala
115 120 125

Ala Phe Gln Lys Val Val Ala Gly Val Ala Asn Ala Leu Ala His Lys
130 135 140

Tyr His
145

(2) INFORMATION FOR SEQ ID NO:23:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 23 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS:
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:23:

Val His Leu Ser Ala Glu Glu Lys Glu Ala Val Leu Gly Leu Trp Gly
1 5 10 15

Lys Val Asn Val Asp Glu Val
20

(2) INFORMATION FOR SEQ ID NO:24:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 20 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS:
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:24:

Val Leu Ser Ala Ala Asp Lys Ala Asn Val Lys Ala Ala Trp Gly Lys
1 5 10 15

Val Gly Gly Gln
20

1. INVENTOR: J. L. ...
2. ATTORNEY: ...
3. ...

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:25:

Phe Pro His Phe Asn Leu Ser His Gly Ser Asp Gln Val Lys
1 5 10

(2) INFORMATION FOR SEQ ID NO:26:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 10 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS:
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:26:

Leu Val Val Tyr Pro Trp Thr Gln Arg Phe
1 5 10

(2) INFORMATION FOR SEQ ID NO:27:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 8 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS:
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:27:

Val Thr Tyr Pro Trp Thr Gln Arg
1 5

(2) INFORMATION FOR SEQ ID NO:28:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 4 amino acids
 - (B) TYPE: amino acid

Tyr Pro Trp Thr

1

(2) INFORMATION FOR SEQ ID NO:29:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 4 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS:
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:29:

Gly Tyr Pro Tyr

1

(2) INFORMATION FOR SEQ ID NO:30:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 4 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS:
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:30:

Gly Lys Pro Tyr

1

(2) INFORMATION FOR SEQ ID NO:31:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 4 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS:
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(2) INFORMATION FOR SEQ ID NO:32:

(B) TYPE: amino acid
(C) STRANDEDNESS:
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:32:

Lys Met Trp Met Phe Arg
1 5

(2) INFORMATION FOR SEQ ID NO:33:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 8 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS:
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:33:

Val Arg Arg Met Phe Gly Gly Tyr
1 5

(2) INFORMATION FOR SEQ ID NO:34:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 6 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:34:

Phe Leu Gly Phe Pro Thr
1 5

(2) INFORMATION FOR SEQ ID NO:35:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 6 amino acids

(ix) FEATURE:
 (A) NAME KEY: Modified-site
 (B) LOCATION: 1
 (D) OTHER INFORMATION: product= "position 1"
label= Xaa
note= "pyroGln"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:35:

Xaa Gln Gln Asp Cys Lys
1 5

(2) INFORMATION FOR SEQ ID NO:36:

(i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 4 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(ix) FEATURE:
 (A) NAME/KEY: Modified-site
 (B) LOCATION: 1
 (D) OTHER INFORMATION: /product= "position 1"
label= Xaa
note= "N-AcetylSer"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:36:

Xaa Asp Lys Pro
1

(2) INFORMATION FOR SEQ ID NO:37:

(i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 3 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(ix) FEATURE:
 (A) NAME KEY: Modified-site
 (B) LOCATION: 1

NAME: "N-AcetylSer"
ID: 37
OTHER INFORMATION: "position 1"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:37:

Xaa	Pro	His	Xaa	Asp	Leu	Ser	His	Gly	Ser	Ala	Gln	Val
1				5					10			